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Maritime Paraphernalia: Weights, Bells, and Rings

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Introduction

On ancient Mediterranean shipwrecks and coastal fishing sites from France to Israel, archaeologists have discovered hundreds (if not thousands) of small lead ring-like objects. Some are almost certainly crude fishing weights, designed to hold down nets cast from shore; others have been identified as grommets/eyelets for the brailing lines of ancient sails. Others are larger, perforated, or adorned with smaller rings and patterns; some have been found in archaeological contexts or quantities that do not seem to fit with the sail grommet theory. Some of these objects perhaps served as anchor line weights; others may have been part of elaborate mechanical bilge pumps. No systematic Mediterranean-wide archaeological study has ever been made of these objects to identify, categorize, and compare their functions. The lack of agreement and conventions in how to identify some of the more unusual small lead objects from maritime contexts makes it difficult to study them collectively or typologically, and in worst case scenario leads to the misinterpretation of maritime archaeological sites and associated human behavior.

At the Yavne-Yam site in Israel, a Bronze Age coastal industrial establishment, a variety of lead objects have been found, and the challenge of identifying them, given their features and the patterns, prompted this study. At the site, there was a large XXXcm ring (part of a group of similar objects I am giving the preliminary categorization as “type B” lead rings) as well as what appear to be bells. In addition, something that appears to be a sounding weight was found at the site with the shape of a bell but much larger. These lead objects would have played an important role in the lives of those living at this site, relying on them for their survival. In addition, fishing and bells are both noteworthy aspects of early Christianity meaning that not only were they both significant sources for survival but also in religion.

Importance of Fishing and Sailing Equipment

Fishing and sailing equipment makes up a significant portion of the artifacts found at seafaring and coastal sites. This equipment is very important in archaeology because these civilizations were sailing cultures and constantly at sea. By figuring out what the purposes of fishing and sailing equipment are, one can better understand the culture. In addition, the studying and identification of this equipment can tell us what techniques ancient seafarers and fishers used and

compare it to the techniques which are used today, some of which have not changed in thousands of years. Through archaeology, we can also learn more about life at sea, such as how those aboard the ship were fed. Since there was no way to store enough food on the ship for an extended period of time, the sailors would be fed by fishing. Fishing and sailing equipment also shows what would have been considered materials for luxury goods. Given the fact that much of the equipment, such as the rings in question, were made out of lead. This tells archaeologists that it was not a "luxury item." If it was, it would not have been used to make the objects on a ship which get lost and break fairly easily.

Types of Rings (Include picture of the different types)

In order to distinguish different rings from each other, they can be put into types. These include the shape of the ring, whether there are protrusions, if those protrusions have holes, their size, and what they are made of. These types are defined in the following way;

Fig. 1. Type A: round, has no protrusion or slit

Fig. 2. Type B: round, has no protrusion, has a slit for line to go through

Figure 1 *Figure 2*

Fig. 3. Type C: round, has a protrusion, one hole in the protrusion, and no slit

Fig. 4. Type D: round, has a protrusion, one hole in the protrusion, and a slit for the line to go through

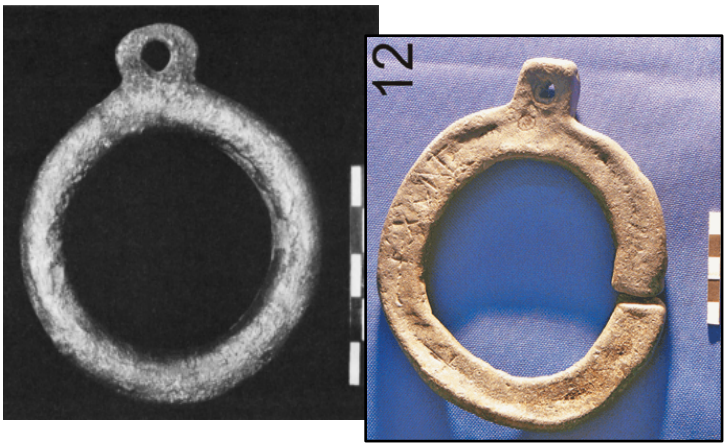

Figure 3 *Figure 4*

Fig. 5. Type E: round, has a protrusion, two holes in the protrusion, and no slit

Fig. 6. Type F: round, has no protrusion, no slit, and one or two holes in body of ring

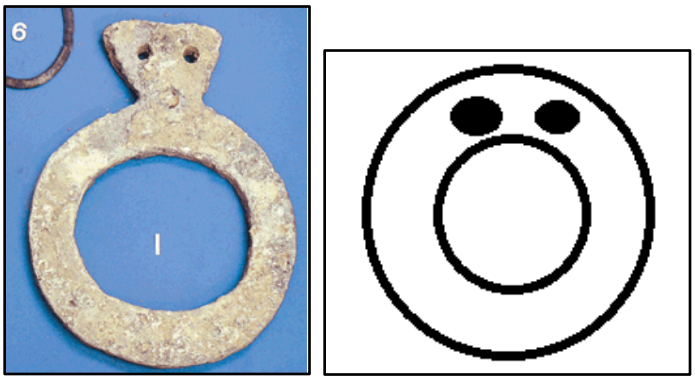

Figure 5 *Figure 6*

Typical Contexts

Lead rings are typically found within coastal and maritime industrial sites as well as at shipwreck sites. The context in which the rings were found in can tell a lot about their function. Rings that are found amongst rigging are probably used for brail lines since the brailing is part of the rigging. Alternatively, net weights and anti-fouling rings could be found in the kitchen area, but are most likely found on deck. Rings are also found scattered about, especially those found that are not in sets. Rings can often be broken as well, meaning that they were used with some type of strenuous purpose.

Functions

There are multiple possibilities for the purpose of these rings. Given the significant variety of their forms, the rings were likely used for a variety of purposes. These uses include net weights, detangling rings, for brail lines, or as anchor weights. Net weights would require the most amount of rings due to the fact that they must go around an entire net and be forceful enough to catch fish. Detangling weights would not require nearly as many but there could still be multiple since it would not be beneficial to only have one since they can break and become lost fairly easily. Rings that go on brail lines would not involve quite the multitude of rings which net weights do but more than one would be needed at a time and, therefore, multiple would be needed as well. These relative amounts can help in deciphering what certain rings found on a ship could be used for. For example, a ship with fifty rings on it most likely used the rings for net weights since there are so many. On the other hand, a wreck with merely one or two rings could be more likely to use the rings for detangling on account of the fact that not as many would be required.

The type of the rings can also aid in determining their purpose. Net weights and brail lines would use rings which did not have slits in them as there would be no purpose to them and would, therefore, only use rings which were types A, C, and E. Detangling rings, on the other hand, would want slits in order to thread the fishing line through it easily. This makes the most practical types of rings for detangling B, D, and F. There are, however, exceptions to the rules since detangling lines do not necessarily have to have a slit. There are also rings which have more than one hole. This would most likely be used for either net weights or brail lines since it would not be necessary for a detangling ring to have to separate holes for the rope to go through and anchor weights would also not require two.

In addition, the other artifacts that are found on a shipwreck or other seafaring site can tell what purpose the rings served. If a shipwreck has lead rings as well as lead ingots that can be attributed to being net weights, the rings are most likely not net weights since there would be no point to having multiple different kinds of objects with the same function due to it being easier to just make several of the same object. Different materials and sizes of rings can also show that they are being used for different purposes. A ring which is only a few inches in diameter probably does not have the same role as a ring which is two or three times its size. Likewise, a

lead ring and a wooden ring cannot have the same functions because they do not have the same properties.

Rings as Net Weights

The most common material of rings is lead. These lead rings are often found in fairly large quantities since they would need to weigh down nets and amongst kitchen wares. Rings would be more beneficial as net weights than other lead items because they do not get caught in nets as opposed to lead ingots which can become tangled in the nets quite easily. There are several shipwrecks that include these rings, most notably the Kyrenia shipwreck. At this fourth century site, over 150 lead rings were found in what is considered the kitchen area of the ship.[1] Lead rings were also found with kitchen equipment on the Formigue A wreck from the second century BCE,[2] and the Datillo wreck from the fourth century BCE.[3] The Cap Lardier 4 shipwreck also included 25 lead rings, which were found in the galley near the hearth.[4] The Giglio Porto wreck from the third century BCE was another shipwreck where multiple rings were found within cooking equipment and animal bones.[5] Moreover, four of these rings were found with a net and other line fishing weights, making it more likely that they were used as net weights.[6] Given the fact that the lead rings were found with cooking equipment, it is possible to theorize that they were used as net weights to help nets sink.[7]

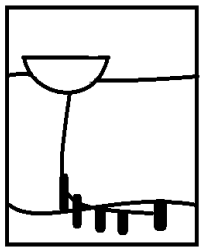

Figure 7

[1] Parker 1992, 232.
[2] Parker 1992, 182. One lead ring was found with courseware and black-ware vessels and fragments
[3] Parker 1992, 160. Multiple rings found with olive pits, cups, plates, bowls, and jars.
[4] Beltrame 2010, 234.
[5] Parker 1992, 193. Lead weights were found in the stern of the ship with butchered animal bones, cooking-ware, drinking glasses, and lamps.
[6] Brown 2011, 120.
[7] Find Citation from "Ancient Nets and Fishing Gear", 105.

Unlike the previous wrecks, the Madrague de Giens shipwreck of the 1st century BCE had lead rings that were not found with kitchen wares but were most likely used for net weights since there were also wooden rings aboard the ship.[8] Another site which had many rings was at the Haifa site off the Carmel Coast in Israel. At the site 25 rings were found which were type A.[9] Given their distribution pattern, archaeologists can tell that they were, most likely, formerly held together by a net, making them net weights.[10] These net weights are comparable to the rings used for brailing or for detangling lines but, unlike the detangling weights, they are found in larger numbers since many would be used at the same time. In addition, they are often found attached to ropes since they did not need to be removed from the nets.

Rings for Detangling

Lead rings could easily be used to detangle lines that were caught while fishing. When hooks get caught on rocks, plants, the seabed, or anything else on the bottom and in depths that are too deep to swim to, a ring can be used to dislodge the hook (Fig. 7). These rings would come in smaller numbers with as few as only a single ring. The Serçe Limani wreck from the11th century CE had a ring that could have been used for anti-fouling. There was a larger ring that was type E and a smaller ring which was type C.[11] The difference in size shows that they could have had different purposes and, therefore, the smaller ring may have been used for freeing tangled line. A rope would be attached to either hole and the caught line would be fed through the middle of the ring. With this, the line could be free by lowering the ring and using the weight to unhook the line.

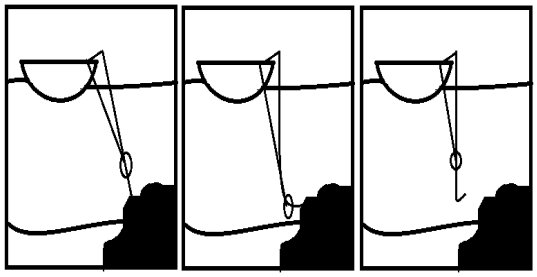

Figure 8

[8] Parker 1992, 250.
[9] Galili, Rosen, and Sharvit 2002, 186.
[10] Galili, Rosen, and Sharvit 2002, 199.
[11] Pulak 1987, 39-41.

Rings with no protrusions, such as types A and B, can also be used for detangling caught line. This can be seen at the 7th century CE site, Tel Dor, off the Carmel Coast. This site had three rings which did not have protrusions and fell under type A. Due to the fact that there are so few, it is possible that they were used for detangling. In addition, 153 rectangular lead sinkers were found at the site.[12] Given the fact that there are over 150 of the folded rectangular sinkers, it is difficult to believe that there would also be three additional ring sinkers, making it highly unlikely that they served as net weights. Rings would also have a slit in them to make it easier to attach them to the fouled line. This can be seen in the fishing grounds on North Beach from Ashkelon, a 6th century CE Byzantine site.[13] This site had two lead rings with protrusions and one hole each and slits (type D).[14]

There were, however, other types of rings that could be used for anti-fouling. Another type of ring was found on the Capistello wreck from the 3rd century BCE which is called a "pretzel" ring and was able to be opened and closed to allow the line to go though.[15] This would not work as a net weight or a brail ring because the weight of either of those could cause the ring to either open or break. Broken rings also could have been formerly used for anti-fouling rings. It is possible for the rings to get caught on something while trying to free a line and then break.

Rings for Brail Lines

Another possibility for lead rings is for brail lines on the sails of ships. Brail lines would have multiple rings but not as many as net weights but possibly more than detangling rings. Rope would run through the rings to help haul up sails and can often be found still attached to or near the rigging. In the Niolon shipwreck from the 1st century CE, many lead rings were found which have been attributed to brail rings.[16] The

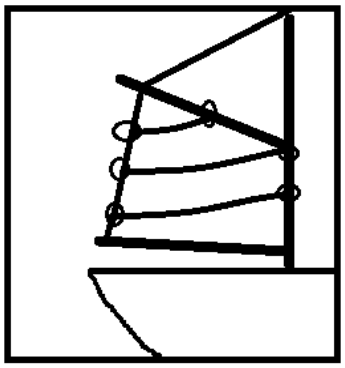

Figure 9

[12] Galili and Sharvit 2007, 69.
[13] Galili *et al.* 2009, 361.
[14] Galili and Rosen 2008, 228. Table 1 shows the salvaging rings of different types. The two lead rings on the Ashkelon would both be type A1, which includes protrusions with two holes and a slit for the line to go through. One can be seen in *Figure 13* (290).
[15] Frey 1978, 297.
[16] Parker 1992, 289.

Grand Congloué shipwreck from the 3rd to 2nd centuries BCE also had over one hundred lead rings which were used for brail lines.[17]

There are, however, rings that were used which were bone or wooden instead of lead on some shipwrecks. The Madrague de Giens wreck has lead rings but it also has many wooden rings.[18] Since the rings are completely different, it is not likely that they would be used for the same purpose. Therefore, it is most likely that the lead rings were used as net weights and the wooden rings were used for brail lines. Another site which featured rings which were not made of wood was port of Myos Hormos, which was a Roman trading harbor from the 1st century BCE to the 3rd century CE.[19] This port had 169 type F rings of varying sizes, of which 118 were cattle horn and 51 were wooden.[20] Similarly, the 1st century CE port, Berenike which is also a Roman port, had several type F rings made up of bone and wood for brail lines.[21] At Berenike, there was also half of a wooden ring which still had the strips for attaching the rings to the sail, solidifying the theory that they were used brail rings.[22] The wooden and bone rings, whether were found amongst ropes, chains, and the rigging or otherwise, cannot be used as net weights or detangling rings since the wood, unless it was completely saturated with water, and bone would not sink and so they must be used on deck for the rigging.

Rings as Anchor Weights

One other possibility for lead rings found in the Mediterranean is for anchor weights. By attaching a weight for the line, the anchor of a ship would not move around as much with currents or by force of the ship. These rings would have to be larger than the rings in the other three suggestions due to the weight which they would need to have compared to a ring which is only supposed to detangle a hook or hold a sail. The Lazaret shipwreck from somewhere between the late 3rd and early 2nd

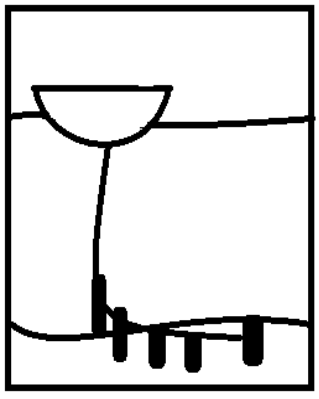

Figure 10

[17] Bound and Vallintine 1983, 120.
[18] Parker 1992, 250.
[19] Whiteright 2007, 282.
[20] Whiteright 2007, 285.
[21] Wild and Wild 2001, 214.
[22] Wild and Wild 2001, 216.

centuries BCE had a single lead ring which was type C.[23] The Porticello wreck from the 5th century BCE had a large ring with two holes and had an irregular shape which is a type E.[24] In addition, the Santa Severa wreck from the 1st century BCE had a large ring.[25] These rings would not have been used for brailing or as a net sinker since there is only one and both of those options would require numerous rings making it more likely that they were anchor weights, given their large sizes. The Serçe Limani wreck from the 11th century CE, the Capistello wreck, and the Haifa site all had different types of rings on them. Since there are multiple types of rings on both of the ships, the different rings were most likely not used for the same purpose making it possible that the larger rings of types E and C were used as anchor weights.[26] This can be seen easily with the Haifa site which has many rings which are under 50g and a few which are over 85, one of which is around 24kg.[27] The 24kg ring was, therefore, more likely an anchor weight due to how heavy it is.

Chronology

For this study, sites ranging from the 5th century BCE to the 11th century CE were researched to reveal the purpose of the rings. These shipwreck and maritime sites were chosen because there was a presence of ring-shaped lead weights. Though this is not a complete collection of the lead rings, there does appear to be a pattern in the occurrence of the rings. By looking at the sites, it was found that the earlier ships of those that were studied seem to have what appear to be net weights on them. The use of rings for brail lines and as detangling rings, however, did not appear until later, mostly after the 1st century BCE. This could easily be because this technology was developed at a later time and perhaps at a different time for different civilizations. The use of the rings as anchor weights, specifically extra heavy weights which do not fit in with other types of weights, appeared in a more spread out fashion, ranging from the 5th century BCE to the 11th

[23] Parker 1992, 241.
[24] Eiseman and Ridgway 1987, 23.
[25] Parker 1992, 385.
[26] Pulak 1987, 39. The Serçe Limani wreck had a large marble ring as well as a small lead ring. The larger ring is more likely to have been used as an anchor weight instead of for detangling line like the smaller ring because it would need to be heavier.
Galili 1993, 64. The Capistello wreck has a lead ring with a protrusion and one hole. The "pretzel" ring would have been for detangling line so it could be removed easily and the larger round ring would have been an anchor weight.
[27] Galili, Rosen, and Sharvit 2002, 186, Galili and Rosen 2008, 290.

century CE. This could be because there was no need to change the technique that was being used to weight down anchors and prevent them from moving. Given the chronological range, anchor weights seem to be the most prolonged usage, compared to net weights which only appears BCE and with brail lines and for detangling, appearing mostly during CE centuries. This can help in the assessment of rings because the usage a ring that could fit the criteria of a net weight or a ring for a brail line could be better determined by looking at its time period.

Texts

For several centuries our main source of information about fishing in the ancient world came from Oppian. He wrote about fishing with nets using the phrase "ἐν κύρτῳ κατέθηκεν ὁμοῦ λίνον ἠδὲ μόλιβδον," (Oppian, Halieutica IV.95) which roughly translates to "they were forced into the net with the fishing line and lead together." Oppian uses the word "λίνον" which can mean "anything made of flax," "the thread of destiny," or "a fishing-net."[28] The word "κύρτῳ" also serves as a net though it can also be translated to "bird-cage" or as an adjective to "curved" or "arched."[29] Since it uses two separate words, they must be translated differently, making "κύρτῳ" more likely to be translated as "net" since it is, in essence, a trapping for the fish, and "λίνον" would better be translated as a "fishing line." The word "λίνον" is also used in by Philippus of Tessalonica (*The Greek Anthology* VI.5.3). The line in the poem is "καὶ λίνον ἀκρομόλιβδον," translating to "and the net leaded at the edge."[30] This is a direct reference to the use of lead to weigh down nets and aid in the catching of fish.

The term "ἀμφίβληστρον," which means "anything thrown round" or a "casting-net."[31] This can be seen in Strabo's *Geography* with the line "καὶ τῷ μὲν ἀμφιβλήστρῳ περιέβαλε τῇ τριαίνῃ δὲ καὶ τῷ ξιφιδίῳ ἔπειρε καὶ ἀνεῖλε," (Strabo, *Geography* XIII. 13.39.) translated as "entangled him in his fishing net, and stabbed and slew him with trident and dagger."[32] The term also appears in Hesiod's *Shield of Heracles*, also translated as "casting-net" (Hesiod, *Shield of Heracles*, 215). The word comes from the combining of the words "ἀμφί," meaning "around" and "βληστρον"

[28] Lidell and Scott 1889, 474.
[29] Liddell and Scott 1889, 458.
[30] Liddell and Scott 1889, 31.
[31] Liddell and Scott 1889, 47.
[32] Jones 1924, XIII. 13.39.

which comes from the verb "βάλλω," "to throw." Together, they mean "throw around" which is what the purpose of a net is.

Interpretation

At the Yavne-Yam site, the lead objects can be identified using the aforementioned information (Fig. 8). First, the large lead ring which had a slit, and no protrusions. With this, it is possible that the ring was used for detangling a caught line by inserting the line through the slit and then lowering the ring to pull the line away from what it was caught on. In addition, what appears to be a bell was found, roughly 3.5cm in diameter and height. This is most likely a bell because of its small size. The larger, similar lead object which is almost 9cm, however, is more likely a sounding weight. Sounding weights would need to be larger than a small, hand-held bell in order to sink properly. With these findings, the site can be identified as an industrial maritime site where fishing and seafaring took place as well as a site which was religious, as were most Roman sites.

Figure 11

Bells and Sounding Weights

Also found at the Yavne-Yam site were lead objects that have the appearance of small bronze bells. They are long, cylindrical, hollow, and have a type of ball in the center often made of a different metal. This leads us to ask why they would have bells. The most well-known use for bells is in a religious way as Sanctus bells which are holy bells that are used in church.[33] During the Roman Empire, small, handheld bells were very common in Europe, the Mediterranean, and

[33] Herrera 2004, 1.

the Black Sea.[34] Bells were also used for good luck in events such as seafaring, sporting events, and so forth.[35] This is more likely for the bells which are found at seafaring sites such as Yavne-Yam. Additionally, there are references in Oppian's *Heleutica* that describe the bells being attached to nets so that they could hear and find the nets when something was caught in them during the night.

Sounding weights are also common at seafaring sites in order to see how deep the water is. These weights are often shaped similarly to bells and, therefore, some of the larger objects that appear to be bells could actually have been sounding weights. This would help prevent the ships from running aground since they would know the depth of the water. The use of tallow, which is a waxy fat substance, became common for Greeks during the 8th and 7th centuries. This was so they could find out what the floor of whatever body of water they were in was made up of such as rocks or sand.[36]

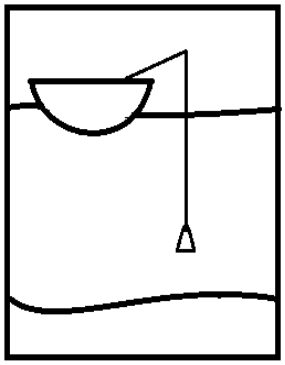

Figure 12

Conclusion

With the abundance of fishing and maritime equipment found at archaeological sites near and on the coasts of the Mediterranean, it is important to study what that equipment could possibly be. By reviewing maritime artifacts, we can better understand coastal civilizations and learn about the types of fishing they took part in. The study of maritime artifacts also reveals knowledge of cultures outside of fishing such as what would be considered a commodity and its impact on

[34] Villing 2002, 257.
[35] Villing 2002, 245.
[36] Oleson 2000, 307.

language. When a culture is centered on something such as seafaring, it will often have an impact on the way that they speak, with more fishing related terms than a culture that lives far from the coast. By looking at objects like the lead rings, we can learn about the techniques that could have potentially been used and how different cultures used these or similar objects, especially since the lead rings are found in significant quantities but there has been no systematic study of them. This assessment, however, can shed light on potential uses for the lead rings, giving them new importance in the archaeological record.

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